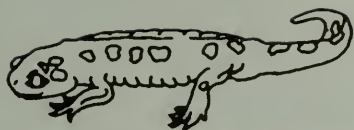


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AMPHIBIANS



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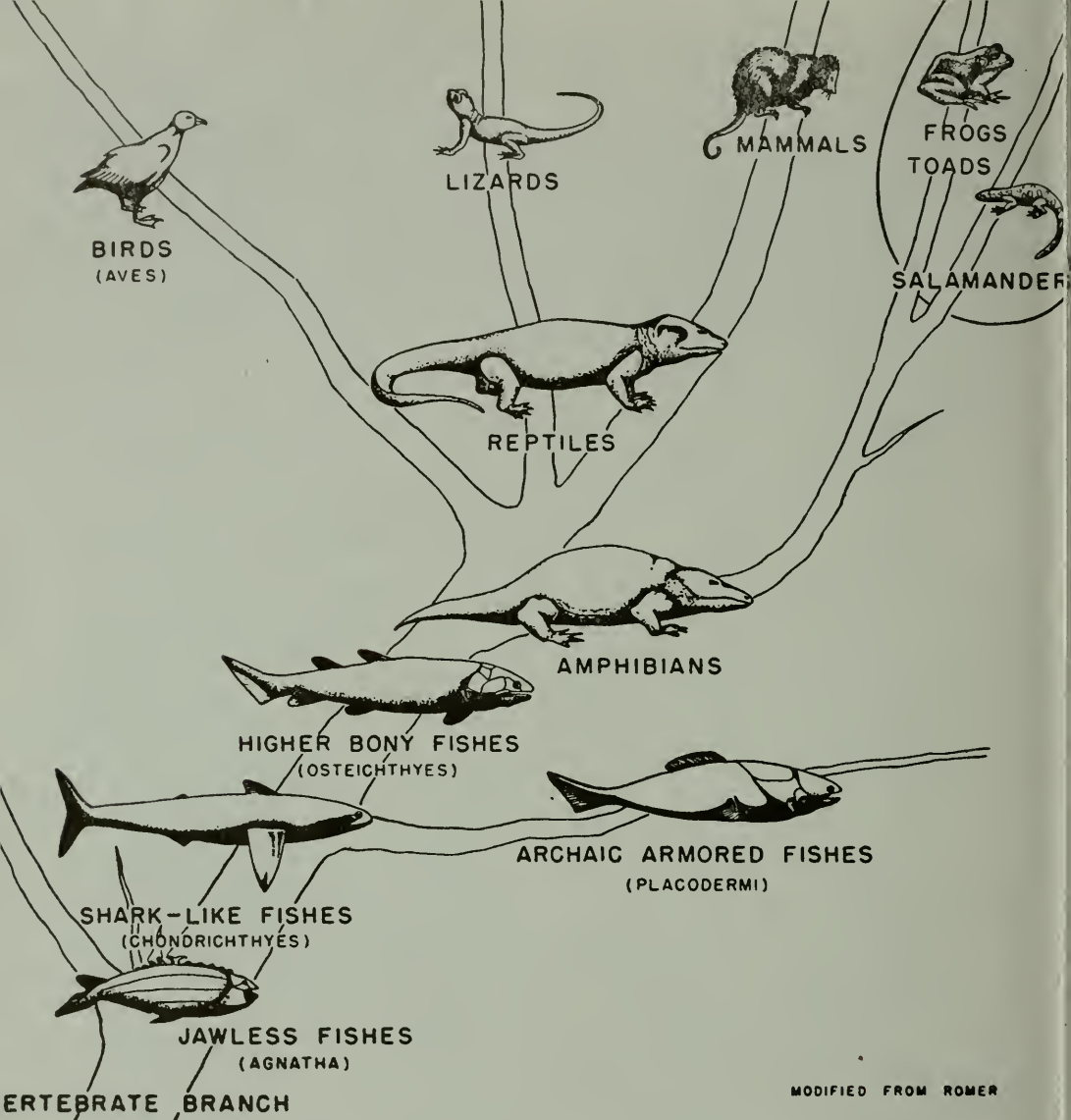


ILLINOIS

PAUL W. PARMALEE



ILLINOIS STATE MUSEUM
STORY OF ILLINOIS NO. 10



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AMPHIBIANS
OF
ILLINOIS

by

PAUL W. PARMALEE



Springfield, Illinois

1954

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Introduction

The purpose of this work is to provide an illustrated and descriptive account for identifying the amphibians of Illinois. Each species of salamander, toad, and frog found thus far in Illinois is considered separately in relation to its distribution in the state, its description, and its natural history in general. Additional information on the natural history of the amphibians as a group is included as an attempt to promote a better understanding of these coldblooded vertebrates.

Good photographs are essential as an aid in identifying the various species of amphibians. Although photographs depicting the animals in their natural habitat setting are perhaps more pleasing from an esthetic point of view, animals photographed against a plain background more advantageously show distinguishing or identifying characteristics. Except for that of the Crawfish Frog, all of the photographs used were taken of live animals, and all of the amphibians known to occur in Illinois are illustrated in this work.

Both the most accepted common name and the scientific name (the genus and species) are included. Although one or more subspecies or geographical races of some of the species described here are found in Illinois, the names are not included in the text since the species is the largest category of its "kind" which satisfies the needs of identification for most. "A Check List of North American Amphibians and Reptiles" by Karl P. Schmidt, 1953, is the source from which the common and scientific names were taken.

Illinois is relatively rich in both numbers and different kinds of amphibians occurring within its borders. Thus far, there have been 18 species of salamanders, 14 species of frogs, and 3 species of toads recorded from Illinois.

Acknowledgements

I would like to express my sincere appreciation to Dr. Philip W. Smith, State Natural History Survey Division, Urbana, for assistance with distributional information, aid in obtaining specimens for photographing, critical comments, and for reading the manuscript. I am also indebted to Dr. Sherman A. Minton, Jr., Indiana University Medical Center, Indianapolis, Ind.; Dr. W. G. Grant, William and Mary College, Williamsburg, Va.; Mr. R. Earl Olson, Rockford; and Miss Esther Bennett, Southern Illinois University Museum, Carbondale, for the loan of certain specimens for photographing. To the authors and their texts (Suggested References, in part) which were used as references for much of the material in this work, I would also like to express my gratitude. All photographs were taken by the Museum photographer, Mr. Charles W. Hodge.

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Natural History of the Amphibians

Surprisingly, certain amphibians are sometimes confused with reptiles by those who are not familiar with the characteristics that identify them. The question has often been asked, "Just what is the difference between a lizard and a salamander? They look alike." Actually, there are many differences that separate these two groups; but if just a few of these are kept in mind, there is little chance of confusing an amphibian with a reptile or any other animal.

The amphibians (toads, frogs, salamanders) possess a smooth, moist skin that is without such structures as hair or scales. The toads vary somewhat from this general rule and have a drier skin that is covered with warts. All adult toads and frogs have two pairs of legs, and all Illinois species are without tails. In these two groups, the hind legs are larger than the front legs and are modified for jumping. The head and trunk are joined in a rather broad, depressed body.

In the case of the salamanders, however, the head and neck are distinct, and the trunk is elongated and is either cylindrical or depressed from top to bottom. All salamanders have a tail, and in a good many species it is flattened laterally (from side to side) and possesses a dorsal (back) and ventral (abdominal) fin. Most adult salamanders have two pairs of legs which are approximately equal in size, and the hind pair is not modified for jumping. One species, however, the Siren, possesses only the anterior or front pair of legs.

There is considerable variation in size of amphibians. For example, the common Cricket Frog seldom reaches a length of more than one inch, while the Bullfrog may grow to 8 inches in length. Most salamanders vary from 3 to 8 inches although certain species get considerably larger.

In contrast to the salamanders, most of which have no vocal cords and are essentially voiceless, the frogs and toads are capable of producing sounds, each species possessing a characteristic call. These calls are heard in the greatest intensity and number during the warm spring nights when the males are searching for mates. Most amphibians are nocturnal although some species of frogs, and more rarely salamanders, are occasionally found active during the day. The majority of amphibians hibernate during the cold, unfavorable winter months, seeking shelter in and under rocks and logs, and in the mud and debris of pond and stream bottoms.

Some amphibians are used for food by man, particularly the Bullfrog, while other species of frogs and salamanders are used as laboratory animals for courses in biology and zoology, for fish bait, and for research in physiology and in related fields. Because many of these forms feed on insects, they are of benefit to man economically. No species of Illinois amphibians are venomous, although the skin secretions of some salamanders, toads, and frogs may be slightly toxic to man and other animals if taken into the digestive track or rubbed over the nasal membranes or into the eyes.

In the case of all Illinois toads and frogs, fertilization is external; that is, the eggs are deposited by the female and then immediately fertilized by the male. Most species tend to have a characteristic breeding place where several to many adults may congregate, such as large lakes and rivers, marshes, small streams and ponds. Depending upon the species, the eggs, which are enclosed in a gelatinous covering, are laid either in large masses, in strings, or occasionally singly. The number of eggs laid by a single female may vary from several dozen to as many as 10,000 or more (Bullfrogs and large toads). The eggs are normally deposited in shallow water, occasionally being attached to vegetation or some other object. The time necessary for hatching is influenced greatly by the species involved and by temperature, generally, the warmer the temperature, the more rapid the development.

Toads and frogs produce larvae known as tadpoles or polliwogs, whose head and body form a single ovoid mass with a long tail having median fins above and below. At first external gills appear which are replaced later by internal gills. Late in larval life, limbs develop, and as the tadpole changes into the adult, the tail is resorbed by the body, lungs develop in the place of gills and the mouth increases greatly in width. At about the same time the food habits change. The tadpole feeds primarily on vegetation while the adult frog and toad is carnivorous, feeding on insects and other animals they are able to catch. This change from the larval stage to the adult is known as metamorphosis or transformation.

Depending upon the particular species of salamander, fertilization of the eggs may be external or internal. As the breeding season commences in the spring, members of some species of salamanders participate in a kind of nuptial or mating dance, in which they thrash around in the water, rubbing noses, swimming and diving about. Usually in this case, the males deposit packets of sperm which are picked up by the cloaca (anal chamber) of the female.

Some salamanders deposit their eggs under rocks and other objects in the water while others utilize moist locations in logs and under stones on the land. In the latter case, there is no free-living larval stage and the egg hatches directly into a miniature adult. The aquatic larvae of salamanders appear quite similar to the adults in general shape, and the changes that occur during metamorphosis (development of larvae into adults) are not so great as in the case of toads and frogs. Some salamanders, for example the Siren and Mudpuppy, retain external gills as adults.

Of the five major classes of vertebrate animals (Fish, Amphibians, Reptiles, Birds, Mammals), the amphibians are next only to the fish in primitiveness, and it is thought that the amphibians evolved or developed from ancient fish-like ancestors during Devonian times (approximately 350 million years ago). The amphibians are, for the most part, restricted to water or very moist situations, and they are dependent entirely on such conditions for reproduction. The amphibians represent the beginning step from an entirely aquatic existence, as is found in the fishes, to a terrestrial one, partially independent of water for many of the normal body functions.

The Collection of Specimens

A variety of techniques is used in collecting specimens of amphibians, although the few standard methods mentioned here are used by most collectors. For the beginner, a review of the various texts and papers on amphibians would be of value. A knowledge of what is to be expected in the region in which one intends to collect, and specifically where to look for a given species (for example, in wet meadows, under rocks and logs near streams, sloughs, etc.), as well as its general habits, is a definite aid.

The spring season represents the best collecting period of the year, since it is at this time that the various species of frogs, toads and salamanders leave their places of hibernation or hiding and congregate to breed. They are then most often found in or near the water or on trees or other vegetation at the water's edge, and with the aid of a flashlight or lantern, they are relatively easy to catch. By driving slowly along the highways at night, the different species of frogs can be heard calling and hence can be located easily. Many amphibians utilize permanent or, more often, temporary bodies of water for breeding purposes (such as small streams and ponds, roadside ditches, swamps, and sloughs) so that visits to these and similar habitats are often rewarded with excellent collecting.

After the breeding season ends and the heat of summer begins to dry up many of the temporary or semi-permanent bodies of water, many of the amphibians seek out retreats in cool, relatively moist areas. Specimens may then be collected in these areas by turning over rotten logs, bark, leaves, and stones. This type of collecting is especially fruitful near a spring or along a stream or pond. Until the specimens can be preserved or placed in permanent containers, some type of cloth sack usually provides the best holding device in the field. Jars with holes punched in the lids can be used in the field, but they are awkward to handle. No matter what collecting container is used, moist leaves or moss should be placed in with the specimens to prevent them from drying.

The Preservation of Specimens

In order to preserve amphibians properly, three simple but essential steps should be followed: (1) Kill the specimen by immersing it in a weak alcohol of less than 30% dilution. (2) Harden the specimen by placing it in 5% formalin (one part commercial formalin with nine parts of water). This solution may also be used for permanent storage. (3) Label the specimen.

The actual process of killing normally takes from one to three minutes, and as soon as the specimen is dead, it should be removed from the alcohol. Other methods of killing may be used, but weak alcohol satisfactorily relaxes the animal and is easily obtainable. Frogs and toads should be arranged in a normal sitting position and salamanders in a walking position with legs extended before placing them in formalin for hardening. It is a good policy to make a small incision in the abdomen of large toads, frogs, and salamanders to insure complete preservation.

Hardening should be complete within two or three days, at which time the specimens can be removed and placed in permanent collection jars containing 10% formalin. A 70% solution of alcohol may be used for

storage purposes; but because of cost and tendency to dehydrate specimens after a period of time, formalin, which is considerably cheaper and can be purchased reasonably from any pharmacy or biological supply house, is generally preferred. Tadpoles and larval salamanders should be stored in 5% formalin. Eggs may be preserved directly in 5% formalin.

A point that cannot be over emphasized is that of labelling correctly all specimens collected. A small label containing the collector's name and field number, locality (county, state, and distance and direction from the nearest town), and collection date should be attached to each specimen by string (No. 8 white thread). The label should be some type of waterproof paper and the information on it written in pencil or in Higgin's Eternal Ink. It is a good policy to keep an accession list or field book in which the same data for each specimen is recorded along with the corresponding field number. Additional information of value may also be kept in a field book: the exact place of capture (under rock, in shallow pond, etc.), time of capture, general climatic conditions, and abundance of the species captured.

The same information should be kept with specimens that are retained alive for a period of time. Too often insufficient or no information is kept with specimens. For example, the only specimen of the Hellbender reportedly collected in Illinois is labeled only "southern Illinois," and consequently some question has arisen as to whether that species actually does occur within the state.

The Care of Live Individuals

Live amphibians are often kept as pets by interested persons and for exhibit and other purposes by teachers. These animals can be kept with little care or expense, provided certain feeding and sanitation problems are considered.

Aquaria of various sizes provide one of the most satisfactory and attractive containers in which to keep live frogs, toads or salamanders. By filling the aquarium with water to a level of two to four inches and including some natural stones or bricks that project out of the water, a suitable artificial habitat is easily provided. Aquatic plants may be added to give the animals additional places in which to hide or rest. If possible they should occasionally be exposed to sunlight for short periods of time, particularly toads and frogs.

Numerous types of habitats can be designed to accommodate live specimens, each of which should contain water and an exposed surface where the animals may rest or take refuge. The water should be changed fairly often, at least every two days, since water polluted with waste products from these animals tends to harm them. A minute amount of table salt (0.15%) added to the tap water in which frogs are kept prevents one of the more common diseases. Even though toads are able to live under somewhat drier conditions because of their thick warty skin, some water in a dish aids in keeping the air moist.

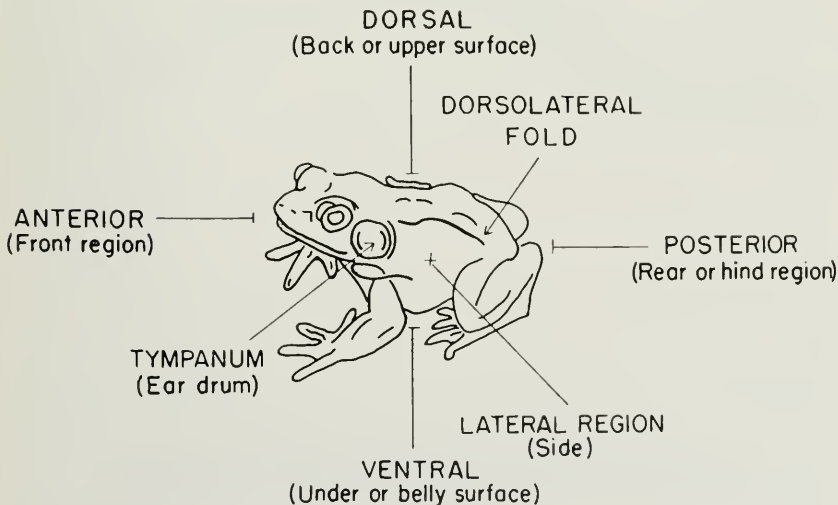
Supplying food of the right type and in sufficient amounts is always a problem. During the warm months of the year insects may be obtained in almost unlimited numbers, and most species of amphibians will readily feed on almost any kind of insect they can capture and swallow. Earth-

worms may also be used with considerable success as a food for captive amphibians, especially salamanders.

There will be certain periods of time, however, when natural foods are difficult or impossible to obtain, and it is then that an artificial diet must be used. Laboratories that raise frogs in large numbers have found that a mixture of raw meat (hamburger) or fish, bone meal, and cod-liver oil provides an excellent, well-balanced diet. Occasionally the animals have to be force-fed such a diet, but by inserting small amounts of this food into the back of the mouth (opening the mouth with blunt forceps and holding it open with a finger), feeding is accomplished with little difficulty. If one or a few amphibians are being kept, it is practical and much easier to raise mealworms or earthworms so that some will be available at all times.

Descriptive Terminology

Certain descriptive terms that have been used in the following accounts of species may be new to some individuals. Without the use of these few terms, however, the problem of clearly and accurately describing the various structures and regions of the different amphibians becomes difficult. With the thought in mind of making these terms and their meaning as clear and understandable as possible, the following labeled diagram of a frog is presented.



Hellbender (*Cryptobranchus alleganiensis*)



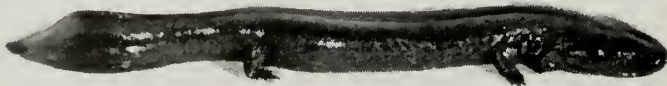
Distribution.—This salamander may occur in southern Illinois.

Description.—The Hellbender or Giant Salamander is one of the largest North American salamanders, with an average length of 18 inches and a maximum length of approximately 27 inches. Its body is soft and has numerous wrinkled fleshy folds along the sides and on the posterior margins of the limbs. The head is broad and flat, being widest behind the eyes. There is a single pair of gill slits or openings, one on either side of the throat. The ground color varies from yellowish-brown to almost black. Spots of irregular size and shape are found scattered over the dorsal surface.

Natural History.—This salamander is to be found in permanent rivers or streams, preferring those that contain submerged logs, rocks and other objects under which to hide. They are nocturnal (active at night), moving about in search of such food as crayfish, worms, insects, snails, small fish and, to some extent, dead animal and plant material.

Breeding occurs in late summer or early fall, and the eggs, which vary in number from 300 to 450 for a single female, are laid in a pair of long strings. The eggs are fertilized by the male as they are deposited by the female in a sheltered nest at the bottom of the stream. This is the only American salamander practicing external fertilization. The incubation period lasts approximately two and one half months. The larvae are nearly 1¼ inches in length at hatching and possess external gills which are not lost until an age of approximately 18 months is reached. Because of the extremely few and somewhat unreliable records of this salamander in the state, it is doubtful if the Hellbender now occurs in Illinois.

Mudpuppy or Waterdog (*Necturus maculosus*)



Distribution.—Statewide.

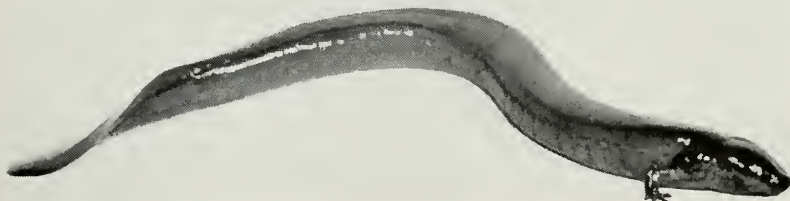
Description.—Characteristic of the Waterdog are the three pairs of bushy external gills located on either side of the neck just behind the broad head. Also present is a groove across the under side of the throat

and a flap of skin at either side of the lower jaw. The tail, which is half the length of the body, has a dorsal and ventral fin. The ground color varies, but generally is a deep rust-brown with spots of blue-black scattered over the back and sides. The maximum length is about 17 inches. There are four fingers and toes on each of the four feet. (Most salamanders possess five toes on the hind feet.)

Natural History.—This salamander, which is found most abundantly in streams, rivers, and well-drained ponds where the water is three feet or more in depth, is entirely aquatic. Bodies of water that contain submerged boards, logs, and stones, the undersides of which are used as nests, are particularly favorable for this salamander. The eggs, which vary in number between 60 and 140, are laid in late May or early June and hatch five or six weeks later. Sexual maturity is attained in about five years when the animal is about 8 inches in length.

This is one of the few salamanders that apparently does not hibernate although winter activity is probably somewhat reduced. They are found primarily in deep water during the summer, moving into the more shallow waters in winter. Crayfish constitute an important food item in their diet as well as other amphibians, fish, leeches, insects and insect larvae. Vegetation is also consumed in considerable quantity.

Dwarf Siren (*Siren intermedia*)



Distribution.—Approximately the southern two-thirds of the state.

Description.—Separating this salamander from all others is the characteristic cylindrical, eel-shaped body and the absence of hind legs. Three pairs of gills are present on either side of the neck, varying in size and shape from short and knobby to relatively long and bushy. They are deep brown to olive-green in color on the back while the under parts are a dull slate color. There are many small, rounded, black spots scattered irregularly over the back and sides of the head, trunk and tail. Maximum length is about 13 inches, average length, 8½ inches.

Natural History.—Little is known of the natural history of this salamander. In Illinois they are occasionally taken in medium sized and large rivers although they are also known to occur in a variety of aquatic habitats, notably muddy sloughs, ditches and ponds. Apparently the eggs are laid in late spring, and over 500 have been recorded from one nest. Food consists of insects and insect larvae, worms, crayfish and other small organisms. As in the case of most salamanders, Sirens are primarily nocturnal.

Jefferson's Salamander (*Ambystoma jeffersonianum*)



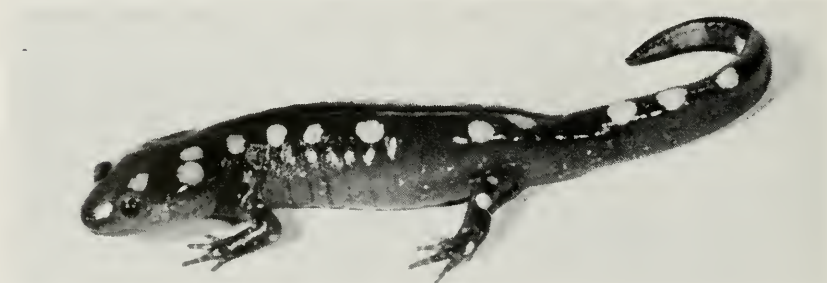
Distribution.—Northern Illinois.

Description.—Differing from many members of the family Ambystomidae, Jefferson's or the Blue-spotted Salamander is relatively slender. The color of the dorsal surfaces and upper parts of the sides is a uniform dark brown to brownish-black. Indistinct, irregular, pale bluish fleckings are present on the lower sides. The tail is relatively long, rounded at the base but considerably flattened toward the tip. Adults are without gills or gill slits; the legs are strong and the toes very long and slender. The average length is about 6½ inches.

Natural History.—Like the Spotted Salamander, this species is found associated with swamps, ponds, and slow streams in mixed and deciduous forests. It occasionally becomes quite abundant on river flats, hiding by day under old logs, bark, and other objects. Food consumed by this species is similar to that of the other salamanders belonging to the genus *Ambystoma*.

The adult salamanders migrate to the breeding ponds in March or early April. The female deposits the eggs in masses, each mass containing between 10 to 40 eggs, and several masses complete a complement which may consist of over 200 eggs. The eggs hatch within four or five weeks, and the time involved for the development and eventual transformation of the larvae varies greatly, from two to over four months.

Spotted Salamander (*Ambystoma maculatum*)



Distribution.—Statewide except in the western portions of Illinois.

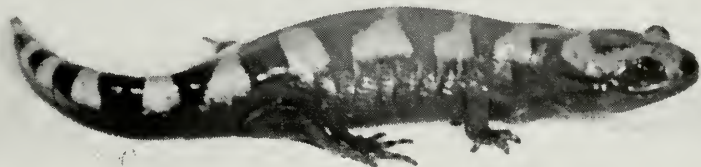
Description.—This salamander, as well as most other species of this genus, are very stout-bodied. As the name implies, the Spotted Salamander is characterized by the presence of two more or less regular rows of widely separated, oval, light yellow or orange spots. These extend along each side of the body from the eyes to the tail, there forming a single row

to the tip. The ground color varies from slate to black or bluish-black on the back to light gray on the under surface. The adults are without gills or gill slits, and typically the hind limbs are slightly stouter than the forelimbs. The average length is about $6\frac{1}{2}$ inches.

Natural History.—The Spotted Salamander reaches its greatest abundance in deciduous and mixed forests where ponds, temporary pools and slow streams offer suitable breeding places. This species is often found under the loose bark of rotting logs and stumps. Food consists of insects, earthworms, slugs, snails and spiders.

Breeding usually takes place in March or early April. Males precede the females to the breeding areas and a rather elaborate nuptial (breeding) "dance" takes place as the females arrive. The eggs, numbering about 100, are deposited in masses and are usually attached to upright stems approximately 6 inches below the surface of the water. The eggs hatch in about 45 days, and a period lasting between 60 and 115 days is required for the larval salamander to develop and transform.

Marbled Salamander (*Ambystoma opacum*)



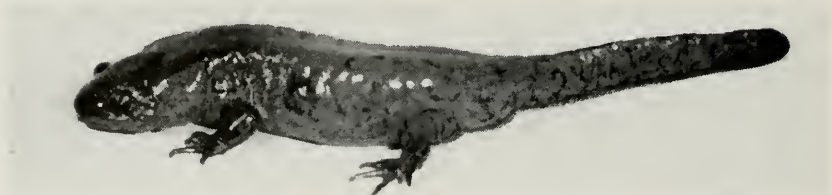
Distribution.—Approximately the southern one-half of the state.

Description.—The body of this species is more typical of the group, being short, stout and thick. The tail is also thick and circular in cross section and is not flattened into a fin as are the tails of many adult salamanders. The ground color is a deep black, with brownish tinges on the legs, toes and underside of the head. There is a series of transverse bands, white in the males and dull gray in the females, extending from the head to the tip of the tail. These bands vary considerably in size, shape and distribution, but generally they are narrow dorsally and wide on the upper sides, sometimes fusing with the ends of adjacent bands to enclose a series of fairly regular black spots in the center of the back. Maximum length is about $5\frac{1}{2}$ inches although the majority of adults average 4 inches in length.

Natural History.—The Marbled Salamander becomes abundant in sandy or gravelly areas and in lowlands bordering ponds and slow streams. It is often found living under somewhat drier conditions than are suitable for most species of *Ambystoma*.

Unlike most salamanders of this group, the marbled salamander breeds in the fall and the eggs are deposited on the ground. The eggs, 50 to 200 in number, are deposited singly in a depression in the ground beneath old bark, logs or leaf litter. These are attended by the female. The period of incubation varies depending primarily on the amount of moisture present, and although the eggs may carry over to spring in the absence of rains, they usually hatch in the fall. Larvae that were hatched in the fall do not transform until the following spring (June) so the larval period may last six to eight months.

Mole Salamander (*Ambystoma talpoideum*)

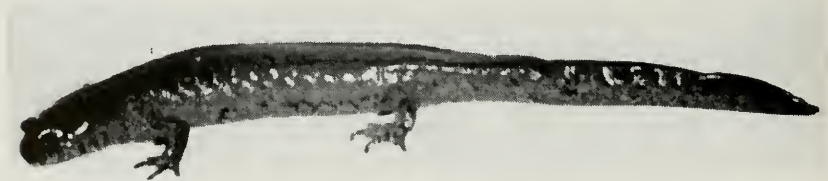


Distribution.—Extreme southern Illinois.

Description.—This species is stout and small, reaching a length of about $3\frac{1}{2}$ inches. The head is quite broad, the trunk well rounded, and the tail short and somewhat flattened laterally (from side to side) toward the tip. The ground color of the upper parts is a deep brown in the form of a broad band that completely covers the head and back. The dorsal surface of the tail is a lighter brown while the lower sides of the head, trunk and tail are bluish-gray in color. There are many small bluish-white flecks scattered over the back and sides, although on the sides the fleckings are more numerous and form larger blotches.

Natural History.—Very little is known of this secretive and rare salamander. The adults do a considerable amount of burrowing, apparently most often in loose moist sand and soil along or near ponds and ditches, and they are seldom seen except during the breeding season. The breeding season probably occurs in March, and transformation of the young takes about two months. Where this species has been observed in Louisiana, it was noted that the eggs were deposited in small masses, varying in number between 4 and 20.

Small-mouthed Salamander (*Ambystoma texanum*)



Distribution.—Statewide except for the northern portions.

Description.—The ground color of living adults is a dark brown or black on the dorsal surfaces, fading to a somewhat lighter brown on the underside. Small irregular, flake-like, grayish-brown markings are numerous above and on the upper sides while on the lower sides these blotchy markings are a lighter grayish-white and frequently larger in size. The head is rather slender and the mouth is small. The average length is about 5 inches.

Natural History.—This species is most commonly found in damp regions close to ponds or pools. They utilize the undersides of logs and bark

for hiding, and apparently they do considerable burrowing, especially during the winter months when they frequently occupy deserted crayfish holes. Earthworms constitute their principal food, although insects are also consumed.

Breeding occurs in March and April. As many as 700 eggs may be laid by a single female, and these are laid singly or in small groups of three or four. They are attached to submerged sticks and stems. Hatching takes place four or five weeks later, and transformation of the larvae requires about two months.

Tiger Salamander (*Ambystoma tigrinum*)



Distribution.—Statewide.

Description.—This is the largest species of *Ambystoma*, and a maximum length of 10 inches may be reached. It is easily distinguished by the large, often irregular whitish or yellowish blotches on the back and sides. The dorsal spots tend to be rounded while those of the sides are often elongate, extending onto the ventral surface. Both the tail and limbs are blotched and occasionally these blotches fuse, forming bands on the lower sides and around the tail. The ground color of the upper surfaces and sides varies from a dull black to deep reddish-brown or dark gray. The ventral areas are lighter, and the underside of the head is often yellow or olive-yellow in color. The legs are stout and the toes are short and blunt.

Natural History.—Except during the breeding season, the adults of this species spend most of the time buried beneath the surface of the ground. Apparently this habit of burrowing or hiding in and beneath logs and other objects enables it to survive under diverse situations. The adults are known to feed on almost any type of prey they can catch and swallow, particularly worms, insects, insect larvae and spiders.

The breeding season covers a period from late February to middle or late March. The eggs, numbering as many as 1,000, are laid in masses. The average is about 50 eggs per mass. The incubation period is relatively short, lasting from two to three weeks. The time involved in the transformation of larvae varies considerably; and occasionally a neotenic condition results; that is, the larvae fail to develop the adult characteristics but become sexually mature anyway, breeding much like the adults and not leaving the water. Apparently cold temperatures are influential in effecting this condition; it is not uncommon in several species of salamanders.

Newt (*Diemictylus viridescens*)



Distribution.—Statewide.

Description.—There are actually three stages of development through which this salamander passes: an aquatic larval stage, a transformed terrestrial (land) stage where the animal undergoes sexual and other development; and an aquatic adult stage. As an aquatic adult the color is an olive-green above, but this varies from yellowish-brown to dark greenish-brown to even a slate color. The throat, ventral regions, and underside of the limbs are yellow. Both the dorsal and ventral surfaces are covered with numerous small, irregular, black spots. Animals of the terrestrial stage are similar in appearance to aquatic adults except they are a dark brown above and the skin is slightly rough to the touch. The tail of the aquatic larvae possesses a median dorsal and ventral fin, which is absent in the terrestrial form, and the general color is a light greenish-yellow. The front legs are somewhat more slender than the hind legs. Average length, 3 inches.

Natural History.—The aquatic adults are, with few exceptions, confined to pools, ponds and swamps. Hibernation on land is sometimes induced by complete freezing or drying up of a pond in which they have been inhabiting although under average habitat conditions these Newts seldom hibernate. The terrestrial forms are found most commonly under logs, leaf litter, and stones. Insects and insect larvae, worms, tadpoles, small crayfish and snails comprise the main items of their diet.

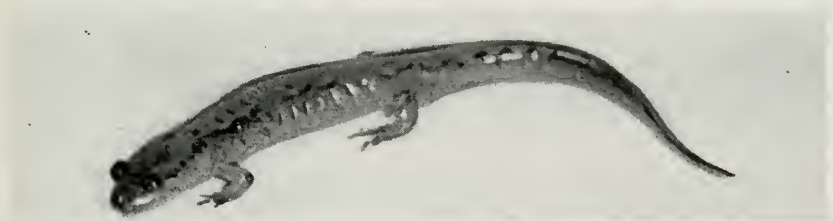
Mating and egg-laying occur in the spring. Between 200 and 350 eggs are laid by a single female, and the eggs are usually fastened to various parts of aquatic plants. Incubation lasts for approximately 30 days. A period of three or four months is required for the larvae to transform, and at the end of this time they wander out on land, returning to water as sexually mature adults after a time interval of $2\frac{1}{2}$ to $3\frac{1}{2}$ years. The dorsal and ventral tail fins re-develop after the Newt returns to the water as a sexually mature adult.

Dusky Salamander (*Desmognathus fuscus*)

Distribution.—Extreme southern Illinois.

Description.—A great deal of variation occurs in the coloration of this species. The ground color of the dorsal surfaces may vary from a light yellowish-brown to a deep brown or black, while the under surfaces are a flesh color, sometimes tinged with blue. Normally there are small

areas on the under surface that are without pigment, appearing as numerous clear spots or flecks. There is usually a broad median dorsal band that is bordered with dark edges, this band often being best developed on the

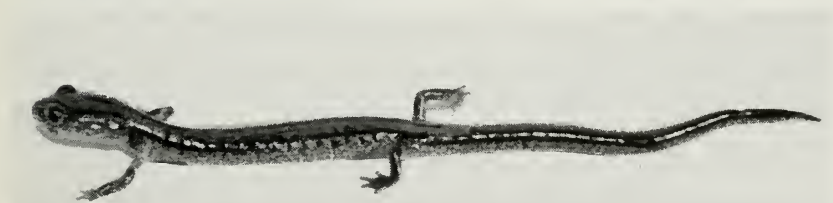


posterior portion of the trunk and basal part of the tail. Maximum length is about $4\frac{1}{2}$ inches, average length, 3 inches.

Natural History.—The Dusky Salamander is found commonly along the edges of springs and clear streams under rotting logs, bark and leaf litter that is continuously moist. They also inhabit partially dry stream beds. The adults are primarily terrestrial but will enter the water on occasion.

The breeding season is in early spring and actual mating is preceded by a courtship dance. The eggs, varying from 12 to 26 in number, are deposited in small clusters in a nest under a stone, log or piece of bark. The eggs are attended by the female until they hatch. The newly-hatched young then enter the water and begin their larval existence, transforming into the terrestrial forms some seven to nine months later.

Red-backed Salamander (*Plethodon cinereus*)



Distribution.—Eastern Illinois.

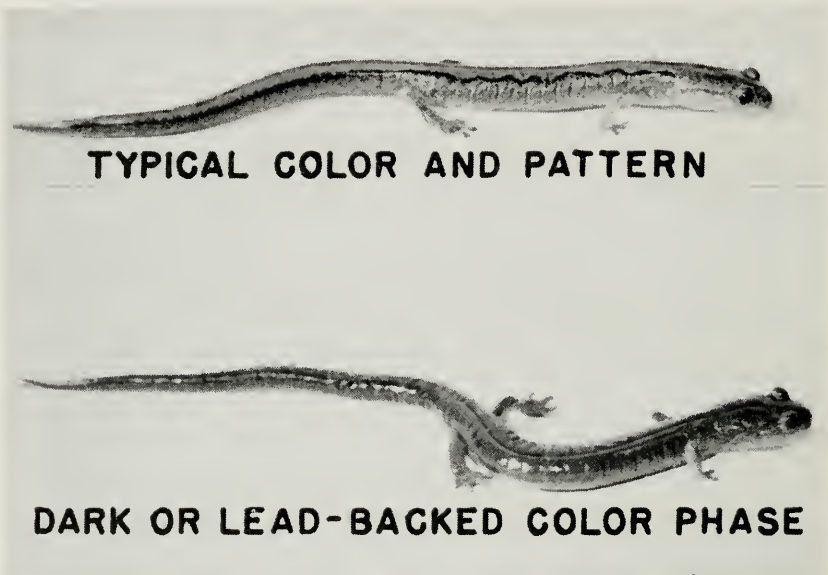
Description.—This salamander exhibits two color phases, although some individuals appear to be intermediate between the two. Characteristic of the red-backed phase is the presence of a broad, median dorsal band that extends from the head and along the trunk to the tip of the tail. This dorsal band down the center of the back varies from shades of pink to brick-red. Numerous small flecks of black are scattered within the band. The ventral region is heavily mottled with gray and white; the sides are dark gray or black. The second color phase, commonly termed the lead-backed phase, differs from the first in that the upper surface is usually a uniform dark gray to almost black. Maximum length is about 5 inches, average length, 3 inches.

Natural History.—Old logs, bark, moss, leaf litter and stones in either deciduous, evergreen or mixed forests form hiding places for this salamander. Although they are found more commonly in moist situa-

tions, they appear to be well adapted to terrestrial life and may inhabit relatively dry situations.

Mating occurs in late fall, the breeding season extending from October to December. The eggs, which are deposited in clusters averaging 8 to 10 in number, are laid in June or July. The eggs are most commonly deposited in moist, well rotted logs, and although the exact time of incubation has not been determined, apparently hatching occurs in about six weeks.

Zigzag Salamander (*Plethodon dorsalis*)



Distribution.—Eastern and southern Illinois.

Description.—This species is somewhat smaller than its close relative, the Red-backed Salamander, averaging about two inches in length and reaching a maximum length of approximately $3\frac{1}{2}$ inches. As the common name indicates, there is a dorsal zigzag band, reddish in color, extending from the back of the head to the base of the tail. In some specimens the band is often incomplete or indistinguishable. Like the Red-backed Salamander, this species also has a dark or "lead-backed" phase. The zigzag pattern in such specimens is often indistinguishable and the upper surfaces are dark gray or blackish in color. The upper sides vary in color from brown or red to a grayish-white. The ground color of the ventral region is a bluish-white and with red flecks in the shoulder region.

Natural History.—This species is most commonly found under stones, bark, and leaf litter in moist areas of woods. It has also been collected in and near the mouth of caves. Other information on the natural history of this form is unknown.

Slimy Salamander (*Plethodon glutinosus*)



Distribution.—Approximately the southern one-half of the state.

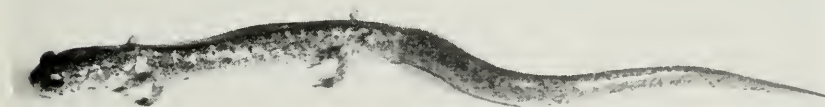
Description.—The Slimy Salamander is one of the largest species of the genus *Plethodon*, with adults varying in length from $4\frac{1}{2}$ to $7\frac{1}{4}$ inches. The general ground color of the dorsal surface is a black or bluish-black while the belly regions are a light slate color. The sides, and occasionally most of the upper surface, are marked with numerous scattered silvery-white flecks, varying considerably in size and shape. This salamander is well named, since the large amount of mucous produced by glands in the skin make it extremely sticky or slimy.

Natural History.—This species is not so tolerant of dry situations as the Red-backed Salamander, and it is seldom found away from a moist habitat. It most frequently utilizes the areas beneath stones, logs and leaf litter, the crevices of shale banks and the sides of wooded gullies and ravines for hiding.

Although the Slimy Salamander occurs commonly in at least 20 states of the eastern United States, little is known of its breeding habits. Apparently mating takes place in the fall, and the eggs are laid sometime during the early spring months. The few records available indicate that the eggs are laid in clusters and vary in number from 10 to 20.

Eastern Four-toed Salamander

(*Hemidactylium scutatum*)



Distribution.—Extreme Northern Illinois.

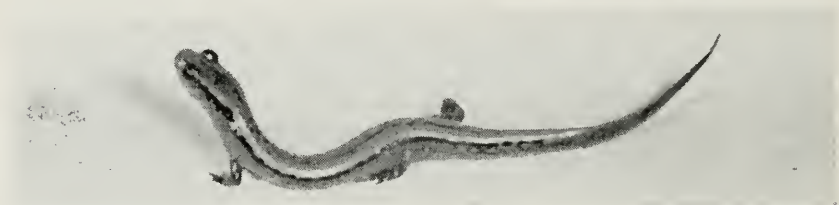
Description.—This is the only terrestrial salamander in Illinois possessing four toes on both the front and hind feet. It is one of the smallest salamanders, with the adults averaging $2\frac{1}{2}$ inches in length. The trunk is short, the body and tail rounded in cross-section. The tail possesses a definite constriction at the base. The ground color of the upper surfaces is a reddish-brown, fading to a dull gray on the lower side. The underside is bluish-white in color, with small, irregular black spots or flecks scattered over the surface.

Natural History.—This species is associated with sphagnum bogs,

swamps, marshes, quiet pools and saturated meadows, inhabiting the adjacent wooded or semi-open areas.

The mating season extends from late summer through fall, at which time the eggs are fertilized. The females leave their winter quarters in early spring and migrate to the breeding areas. The eggs, which number about 30, are laid singly and are deposited among grass roots or in sphagnum moss growing near the water's edge. The female usually remains with the eggs until they hatch, a period of time varying from 40 to 60 days. Upon hatching, the minute larvae enter the water; the larval stage lasts approximately six weeks, at which time transformation occurs.

Two-lined Salamander (*Eurycea bislineata*)



Distribution.—Eastern Illinois.

Description.—This salamander, like all representatives of the family Plethodontidae, is characterized by the presence of a nasolabial groove. This is a groove, sometimes almost indistinguishable, running from each nostril to the edge of the dorsal lip. In this particular species, the body is slender with the total length seldom exceeding $3\frac{1}{2}$ inches. The ground color varies from a dull greenish-yellow to a bright orange-yellow and brown. There is a broad light-colored band on the back, running from the top of the head to the tip of the tail. There are many small irregular black spots within this dorsal light band which in some individuals almost form a regular median line. The wide dorsal band is lined on either side by a black stripe that originates behind the eye and continues along the trunk at least half way onto the tip of the tail.

Natural History.—The Two-lined Salamander is found in extremely moist situations, occurring most commonly along small creeks, streams, and clear pools, hiding beneath stones, logs, and other objects.

Mating occurs in the spring with the breeding season extending from January to April. The eggs, which number about 30, are attached to the underside of stones and other objects in running water. The incubation period lasts approximately one month, and a period from two to three years may elapse before the larvae transforms. In certain localities this salamander may become quite abundant.

Long-tailed Salamander (*Eurycea longicauda*)

Distribution.—The southern one-half of the state.

Description.—As the common and scientific names indicate, this species has a long tail; it is without fins and it is marked with vertical dark bars on the sides. The body is rather slender and the eyes, which protrude noticeably from the sides of the head, are large. The ground color varies from yellow to bright orange above and unmarked white

below. There is a broad, pale yellow dorsal band on the body which is marked with a double series of, or scattered, small black spots down the middle of the back. There is a broken black band along each side of the head and trunk, and the upper surfaces of the limbs are mottled with

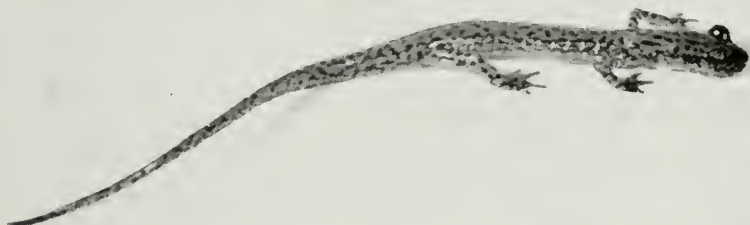


black markings. Maximum length is about 7 inches, although the majority of adults average $4\frac{1}{2}$ inches.

Natural History.—Although the adults are primarily terrestrial, they are known to enter the water, possibly in a search for food. The Long-tailed Salamander utilizes insects and insect larvae, spiders, mites and vegetation for food. During the day they are found most frequently beneath rotting logs and under stones near the edge of cold-water streams and springs.

As in the case of many salamanders, actual mating is preceded by a somewhat elaborate courtship, consisting of considerable rubbing of bodies and tails. Apparently little is known of the time of mating, egg-laying, incubation, and transformation of the larvae. May has been listed as the month in which eggs are laid. Apparently the eggs are attached to the undersurface of stones found in shallow water.

Cave Salamander (*Eurycea lucifuga*)



Distribution.—Approximately the southern one-third of the state.

Description.—This is a slender salamander that has a long tail, a rather broad, flat head and large eyes. The maximum length is about $6\frac{1}{2}$ inches, although the majority of adults average $4\frac{1}{2}$ inches. The ground color is normally a bright orange-red above becoming somewhat lighter below. Numerous irregular, rounded or elongate small black spots are scattered over the dorsal and lateral surfaces. The lower surfaces are without markings.

Natural History.—This salamander is found most abundantly near the entrance to or in the semi-dark regions of caves. They may be found on the floors or walls of the cave itself or under logs, stones, and debris near the cave entrance. Almost nothing is known of the breeding season, eggs, larvae or natural history in general of this species.

Eastern Spadefoot Toad (*Scaphiopus holbrookii*)



Distribution.—Extreme southern Illinois.

Description.—Although the Spadefoot is called a toad, it possesses a much smoother skin than the common Woodhouse's toad with which most individuals are familiar. There are small warts scattered over the skin in addition to the larger paired parotoid glands found on the back directly behind the eyes. In many toads, these glands produce a somewhat poisonous substance that is often distasteful and even toxic to animals attempting to eat them. The ground color above consists of varying shades of brown to almost black, fading to grayish on the belly and white on the throat and breast. Originating from behind each eye and extending to the vent is a dorsal stripe varying in color from a lemon yellow to a greenish yellow. Like other toads, the body is short and broad, and the maximum length reached is about 3 inches. On each heel there is a pronounced horny ridge that is used as a spade to work the soil as the toad attempts to dig.

Natural History.—Except during the breeding season, the Spadefoot spends its time buried in the ground or hiding in or beneath logs and under bark, in either moist or completely dry situations. Unlike most other amphibians, the period of activity and mating is induced primarily by heavy rains instead of a rise in temperature. This toad is quite rare in Illinois and difficult to collect.

Depending upon heavy rainfall, the Spadefoot may breed anytime between March and September. The eggs are laid in irregular bands along the vegetation in shallow water. Most frequently temporary pools and ponds are utilized for breeding; development of the egg and tadpole is quite rapid. Usually the eggs have hatched by the second day and transformation of the tadpole into the adult occurs within two weeks to two months.

American Toad (*Bufo terrestris*)

Distribution.—Statewide.

Description.—This toad reaches a maximum length of about $4\frac{1}{2}$ inches, having a short broad head and a fat body. The skin is very

warty; the warts vary considerably in size, some of them being quite enlarged and occasionally bear small "spines." The ridges between the eyes are distinct and the paratoid glands are large and broad. The ventral surface is roughly granular, and its ground color varies from shades of yellow to bluish gray or white. The underside is densely marked with black spots; a good characteristic to use in separating it from Wood-



house's toad. The ground color of the dorsal parts is a dark gray or reddish. There are usually several black, light-outlined spots surrounding one to three warts on the back and upper portions of the legs, while larger individuals often possess black, light-edged bars across each eyelid.

Natural History.—In areas where this toad occurs, it is found in almost every type of habitat: in cultivated and fallow fields, gardens, and wooded areas. They are primarily nocturnal, hunting for food which consists primarily of insects although almost any kind of small invertebrate animal is eaten. During the day they are most often found hiding under boards, stones, logs, brush piles, bushes, and other cover.

During the cold months they hibernate, probably in underground burrows, and with the rise of spring temperatures they emerge and congregate at more or less permanent pools and ponds to breed. This occurs primarily during April and early May. The eggs are laid in double strings, varying from 4,000 to over 20,000 in number for a single female. These hatch in 3 to 12 days and the tadpoles, which are small and almost completely black in color, transform five to six weeks after hatching.

Woodhouse's Toad (*Bufo woodhousei*)

Distribution.—Statewide.

Description.—This toad is similar in appearance to the American Toad although it does not become quite as large. The ground color of the dorsal surface is a dull grayish or yellow, while the undersides vary from white to gray. There are blackish or greenish spots on the upper parts which vary in size and include from one to many warts. The

best identifying characteristic is the unspotted ventral surface, occasionally marked only by a median black spot on the upper breast.

Natural History.—Like the American Toad, a large variety of situations are inhabited although this toad is often found most abundantly



in long grass and mixed grass prairie. It also occurs commonly along small streams and other bodies of water as well as the edges of wooded areas. The young toads are active during the day as well as at night while the adults are primarily nocturnal. During the day they will burrow into soft soil or sand or hide under logs, stones and other objects. This species is probably the most common toad in Illinois.

The breeding season extends from May to July and, although conditions might be particularly favorable, not all individuals breed at the same time. The eggs, which again may number over 20,000 for a single female, are laid in double strings and are deposited preferably in shallow, somewhat muddy water. Apparently almost any type of permanent or temporary body of water is used for breeding. The incubation period lasts about one week, and transformation of the tadpole into the adult occurs five or six weeks after hatching.

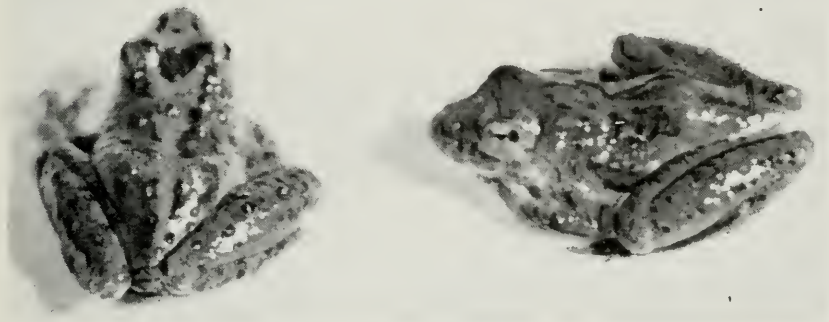
Cricket Frog (*Acris gryllus*)

Distribution.—Statewide.

Description.—This is the smallest frog that occurs in Illinois, usually reaching a length of no greater than one inch. The surface coloration of the upper parts varies from gray to black, reddish, green or different shades of brown. Usually present between the eyes is a dark triangular mark with a white border behind. Frequently there is an irregular band, often hour-glass in shape and green, white or red in color, down the center of the back. There are usually four dark bars across the upper lip on each side and a white stripe that runs from the eye to the arm. The under parts are whiteish or tan and usually unspotted. Unlike most

frogs the skin of the dorsal surface is almost always covered with small smooth warts while the upper eyelids are always warty.

Natural History.—Probably without question this is the most common small frog in Illinois, and it is found associated with almost every type of aquatic situation. They are usually found most abundantly



in low vegetation bordering partially shaded streams although they may be exceedingly numerous on open mud banks of ponds and rivers. They are active during the day and at night, and the cricket frog is often the first frog to be seen in early spring and the last one to be observed in late fall. Like most frogs it feeds on a variety of insects (both adults and larvae), spiders, crayfish and other small animals with which it comes in contact.

The breeding season usually extends from May to August. Each female will lay an average of 250 eggs. The eggs are usually deposited singly and are attached to the stems of grass and other plants in water. The tadpoles normally transform between two and three months after hatching.

Green Tree Frog (*Hyla cinerea*)



Distribution.—The southwestern edge of Illinois.

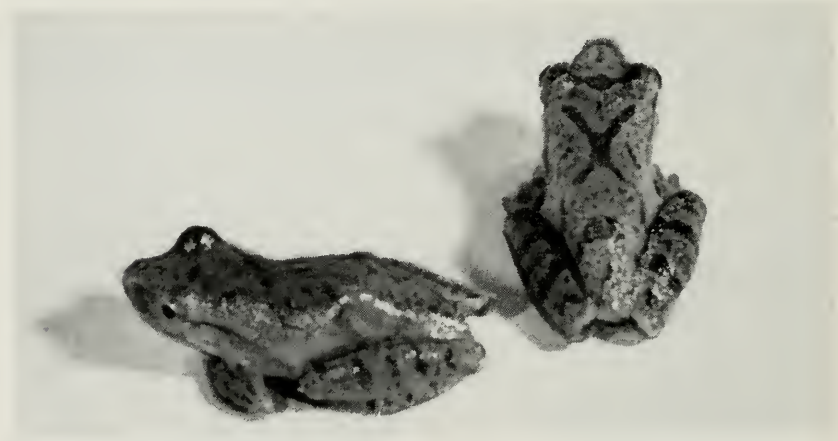
Description.—Characteristic of the family Hylidae (tree frogs), and especially pronounced on the Green, Bird-voiced and Common

Tree Frogs, are the expanded tips of the toes into suction cups or disks that are used in climbing. This is perhaps the most striking frog occurring in Illinois; the dorsal portions vary from a dull to a bright green, and the back and top of the head are often flaked with tiny orange or gold colored spots. The under parts are whitish or cream colored, and there is a white lateral stripe that originates at the end of the nose and extends along each lower side of the head to about the mid-point of the trunk. This is a very slim frog, and it averages about 2 inches in length.

Natural History.—The Green Tree Frog is found most commonly along the swampy edges of marshes and ponds. Although their distribution is limited in Illinois, they are extremely common where they occur. During the day they can be found clinging to the leaves of cattails, water lilies, and other kinds of vegetation growing in or near water. This species is nocturnal in its activities, moving about and searching for food which is comprised primarily of flying insects.

The breeding season extends from about the middle of May to the middle of August, but just when breeding actually occurs within this period apparently depends upon certain favorable weather conditions. The eggs are laid in small packets and are attached to vegetation at or near the surface of the water. The tadpoles which are also green in color, transform in approximately two months after hatching.

Spring Peeper (*Hyla crucifer*)



Distribution.—Statewide.

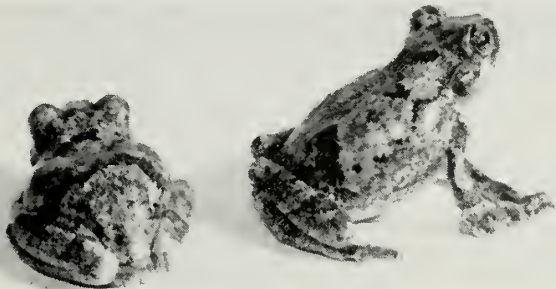
Description.—This species is characterized by the blackish markings on the back that form more or less of an oblique cross. There are dark bands across both the fore and hind limbs, and there is a band between the eyes. The ground color of the dorsal surfaces is a light brown, while the under parts are yellowish or pink and may be either unmarked or flecked. The Spring Peeper is a small frog having a maximum length of $1\frac{1}{4}$ inches.

Natural History.—The Spring Peeper is most abundant in open low-land marshes, swamps and flood plain forest areas. It does occur,

however, in almost any temporary or permanent body of water, from roadside ditches to large ponds and lakes.

The breeding season extends from late March to about the last of April. The eggs, which may number 800 to 1,000 are laid singly and are deposited among grass or other plants in matted vegetation near the bottom of the pond. The eggs hatch in four to five days and transformation of the tadpole into the adult occurs approximately three months later.

Bird-voiced Tree Frog (*Hyla phaeocrypta*)



Distribution.—The southern tip of Illinois.

Description.—This species is very similar in color and markings to that of the Common Tree Frog. It is more slender, however, and smaller, reaching a maximum length of about $1\frac{3}{4}$ inches. The concealed surfaces of the thigh, groin and shanks are a pale yellowish green instead of orange as in the Common Tree Frog.

Natural History.—This tree frog is found in deep swamps. In such areas where it does occur, the Bird-voiced Tree Frog is fairly common, and its characteristic, high-pitched call may be heard from about the middle of May to the early part of summer. Little is known about the life history of this frog in Illinois. In a few of the southern states, the Bird-voiced Tree Frog has been studied in some detail in the laboratory and to a lesser extent in the field. Breeding pairs have been observed during May in Florida, and additional information on this species in Tennessee gives an indication that the eggs are laid in packets containing 6 to 15 eggs. Apparently the eggs develop rapidly and hatching occurs within one to two days. Based on records of laboratory raised tadpoles, development and transformation are completed about one month after hatching.

Common Tree Frog (*Hyla versicolor*)

Distribution.—Statewide.

Description.—The color of the upper surfaces of this frog varies from a light gray to green. The center of the back is usually a somewhat darker gray and there are black-outlined markings that often form a bluntly-pointed, irregular star. There is a dark bar across each upper eyelid and the limbs are marked with broad dark bands. The concealed portions of the thigh, shank and groin are orange to yellowish-

orange in color. The under parts are whitish or cream colored and may or may not be marked with black spots. This frog is able to change its color from gray to green and then back again, apparently being influenced partly by the color of the surface upon which it is resting. Its



body is considerably stouter than that of the Green Tree Frog, and it reaches a maximum length of about $2\frac{1}{4}$ inches.

Natural History.—This frog appears to be restricted primarily to wooded areas associated with permanent bodies of water such as marshes, lakes and streams. Except during the actual breeding season when they are in or at the water's edge, they may be found hiding most often in trees, particularly under loose bark and in the decayed parts.

The breeding period extends from the last of April until about the middle of July. The eggs, which may number 1,800 for a single female, are laid in packets of 30 to 40. The eggs hatch within four or five days, and the tadpoles transform in six to eight weeks after hatching.

Swamp Tree Frog (*Pseudacris nigrita*)



Distribution.—Statewide.

Description.—This is another small frog that reaches a maximum length of only $1\frac{1}{2}$ inches. It is a light slate gray color above, while the ventral surfaces are whitish with a few small black spots occasionally

present on the chest. Characteristic of this frog are the three broad dark stripes down the back. These may be either solid or broken; in the latter case the stripes are often formed by a series of dark spots. The limbs are barred with transversely elongate spots.

Natural History.—The Swamp Tree Frog or Chorus Frog is found most abundantly during the spring in low marshy areas. They also frequent small streams and temporary pools in pastures or along roadsides.

Breeding occurs in early spring, primarily during March and April in the northern states. The eggs are laid singly or in small clusters and are usually attached to stems and other portions of submerged vegetation. A period of approximately two months is required for development of the egg and tadpole and transformation to the adult stage.

Strecker's Chorus Frog (*Pseudacris streckeri*)



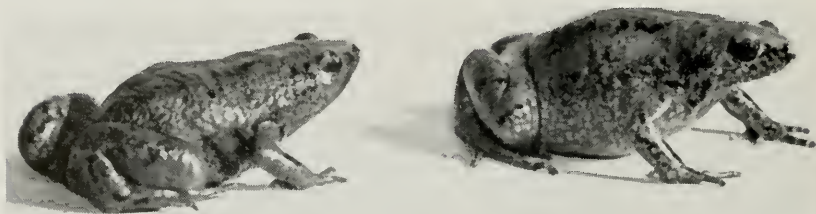
Distribution.—West-central Illinois.

Description.—Compared to the Striped Chorus Frog and many of the smaller frogs belonging to the family Hylidae, this species is more toadlike in shape, having a wide, short head and a rather short and squatty body. It reaches a maximum length of approximately 2 inches. The ground color of the upper parts varies from a dull gray to olive-brown. The under parts, except the the olive-colored throat, are cream colored and unmarked. Frequently there is a triangular or V-shaped mark between the eyes and usually there are large spots or blotches on the back and upper sides. The legs are marked with dark crossbands, and there is a dark line that extends from the snout through the nostril and eye to the point of attachment of the front leg.

Natural History.—In Illinois this frog is apparently confined to certain sand areas along the Illinois River. Although it has been collected from a somewhat restricted area, it is common where it occurs. During early spring it can be found in roadside ponds and various other temporary and semi-permanent bodies of water.

The breeding season probably extends from the middle of March to the middle of April. The eggs, which may number 400 to 500 for a single female, are laid in small bunches and are usually attached to portions of submerged vegetation or debris. In the southern states, about two months are required for development of the tadpole and its transformation into the adult. As yet little is known about the life history of this frog in Illinois.

Narrow-mouthed Toad (*Microhyla carolinensis*)



Distribution.—Southwestern Illinois.

Description.—A small head, pointed snout, stout body and limbs, and a fold of skin across the head just back of the eyes characterize this frog. It is a small frog; the adults average $1\frac{1}{2}$ inches in length. The upper parts are a dark slate gray to black in color, sometimes having a yellowish or olive cast. There are numerous irregular blackish or bluish white spots on the back, while the gray or brown under parts are densely mottled with small, rounded, light spots.

Natural History.—The Narrow-mouthed Frog is usually associated with wooded areas that are moist, although they are occasionally found in rather dry situations as well. They are nocturnal frogs, spending the daylight hours hiding in rotted logs and under boards, rocks and other objects.

Little is known of the natural history of this frog in Illinois. In southeastern United States, the breeding season extends from April through August. One female may deposit, on an average, 850 eggs which are laid in packets on the surface of primarily temporary pools. The period of time necessary for development and transformation varies from three weeks to over two months. They are seldom seen except during the breeding season, apparently remaining buried during the rest of the year.

Crawfish Frog (*Rana areolata*)



Distribution.—Approximately the southern one-half of the state.

Description.—The color of the upper surfaces of this moderately large frog ($2\frac{1}{2}$ - $4\frac{1}{2}$ inches) is a slate gray or light brown. The back,

top of the head, and upper sides are marked with many large, rounded, light-edged, dark brown spots while the ventral regions are white and unmarked. The forelimbs are blotched while the hind legs are marked with several dark cross-bands. The skin on the sides possesses small, rounded warts; and on the back, extending posteriorly from the eye to the groin, is a pair of distinct dorsolateral folds.

Natural History.—The Crawfish or Gopher Frog is found most commonly inhabiting old crayfish holes in low, moist fields and meadows. They apparently live in these burrows most of the year and are seldom seen except during the breeding season. Although they are fairly common in Illinois where they occur, they are seldom observed because of their secretive habits.

The breeding season, normally March and April, commences in response primarily to heavy rains and not a rise in temperature as in the case of most amphibians. Temporary pools are utilized and the eggs, which average about 7,000 for an individual female, are laid in masses. Apparently the tadpoles transform sometime during the same season in which they hatched.

Bullfrog (*Rana catesbeiana*)



Distribution.—Statewide.

Description.—This is the largest species of frog occurring in Illinois, with a maximum length of 8 inches being attained. The upper surfaces are greenish to brown in color and are often marked with small blackish spots. The hind legs are usually patterned with indistinct spots or bands. The underparts are whitish or a cream color and are usually unmarked, although the chest and throat are often heavily mottled with dark color. The tympanum or "ear drum," located directly behind the eye, is very large and bordered above by a distinct fold; there are no dorsolateral folds, however. The upper surface is often roughened with small, rounded tubercles or warts.

Natural History.—The Bullfrog is restricted primarily to permanent bodies of water such as the larger rivers, lakes and marshes that contain deep water although smaller, more shallow ponds and streams are occasionally inhabited. This frog is nocturnal and can be found sitting in shallow water or on the edge of the bank of a lake or river. It feeds upon a variety of different insects, spiders and small vertebrates. During the day they remain hidden under rocks, logs, and other objects in or near the water.

Breeding takes place during May and June. The eggs, which may number as high as 10,000 to 20,000 for a single female, are laid in large rafts or masses. The eggs hatch in four or five days and normally a period of two years lapses before transformation of the tadpole takes place. By the second summer after hatching, the tadpoles may be over 6 inches in length.

Green Frog (*Rana clamitans*)



Distribution.—Statewide.

Description.—This is a moderately large frog that averages about 3 inches in length. The dorsal surfaces are olive to brownish green in color, and occasionally there are indistinct blackish blotches scattered over the back, top of the head, and sides. The limbs are usually marked with dark, narrow bands. The under surfaces are white and unmarked except the throat which is sometimes lightly mottled with gray or brown. In the males the throat is yellowish and they possess a bright green mask that extends from the tympanum forward along the jaw. The hind legs, back and upper sides are often covered with small, rounded tubercles, and there is a pair of dorsolateral folds present that extend from behind the eye posteriorly only half the length of the back.

Natural History.—Although the Green Frog occurs throughout the state, it is common only locally, and these localities are often quite spotty. It is similar to the Bullfrog in that it is more or less restricted to permanent bodies of water such as springs, pools and streams. It is active both at night and during the day, feeding primarily on nonaquatic insects.

Breeding occurs during May and June. A female will lay 1,000 to 4,000 eggs, and these are deposited at the surface of the water in the form of a film or raft. Apparently two years are required for the development and transformation of the tadpole, the latter taking place sometime during the second summer after hatching.

Wood Frog (*Rana sylvatica*)



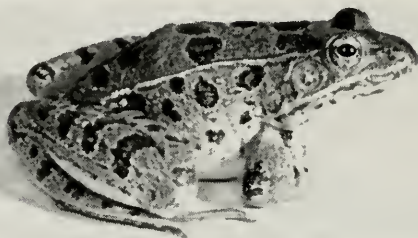
Distribution.—Statewide.

Description.—In comparison to other frogs included in the family Ranidae, the Wood Frog is somewhat smaller and seldom reaches a length of over 2 inches. It is a dark gray or brown on the upper surfaces. Usually the dorsal areas are unmarked, but occasionally there is a median white stripe present, and when it is present, there is usually a dark area down the middle of the back bordering the stripe. There is a pair of dorsolateral folds present that extend posteriorly to the groin, and the skin possesses small, smooth irregularities that give it a somewhat warty appearance. The under sides are white and unmarked except for the throat and chest which are usually speckled. There is a dark mask on the side of the head that extends from the snout through the eye and tympanum; it is bordered below by a prominent broad white stripe. The hind legs are marked with narrow bands and occasionally the sides contain spots of various sizes.

Natural History.—The Wood Frog is restricted to wooded sections and does not inhabit open areas. It is a relatively uncommon frog in Illinois.

Breeding occurs in woodland pools rather early, usually during March and April. The eggs, varying in number from 2,000 to 3,000, are laid in masses and are normally attached to submerged vegetation of some type. The eggs hatch within one to three weeks, depending upon the temperature of the water. The development and eventual transformation of the tadpole requires six weeks to about three months. It is believed that, unlike most other members of the Ranidae, the Wood Frogs hibernate on land under logs, stones and other objects.

Leopard Frog (*Rana pipiens*)



Distribution.—Statewide.

Description.—The ground color of the upper parts varies from gray to light brown or dull green. The top of the head, back and upper sides are marked with large, somewhat rounded dark gray or blackish spots with light borders while the legs are either spotted or banded. There is a light line along the jaw that extends posteriorly over the arm and is bordered below with a dark stripe. The under parts are white and unmarked. There is a pair of dorsolateral folds present that originate behind the eyes and extend to the groin. This frog is of moderate size, reaching a maximum length of about 4 inches.

Natural History.—The Leopard Frog is one of the most common and widely distributed representative of the family Ranidae or the “True Frogs” in North America. They can be found in almost every type of water habitat, from temporary pools to permanent lakes and rivers. It is also not uncommon to find them in damp situations far from any standing body of water. During the unfavorable winter months they hibernate in mud and water at depths below the frost line.

This is one of the first frogs to emerge from hibernation in the spring. The breeding season extends from the last of March to about the first of May. A single female may lay 4,000 to 6,500 eggs, these usually being deposited in one to several masses and attached to a submerged stick or other object near the surface of the water. Occasionally they are deposited on the bottom unattached, but in any case they are usually laid in open, shallow water. Hatching occurs in five to twenty days, and transformation of the tadpole takes place in about three months.

Pickerel Frog (*Rana palustris*)



Distribution.—Statewide.

Description.—The Pickerel Frog is characterized by the tan or

light brown color of the dorsal surfaces and by the two more or less regular rows of light-bordered, reddish-brown square or rectangular blotches down the center of the back. There are similar but more rounded blotches on the sides while the fore legs are blotched and the hind legs banded. There is a pair of distinct dorsolateral folds present that extend from behind the eyes posteriorly to the groin, these often being silvery in color. The under surfaces, except the concealed areas of the thigh and groin which are yellowish orange in color, are usually white and unmarked. Maximum length is about 3 inches.

Natural History.—Cold clear springs, ponds, streams and lakes that are of a permanent nature provide the most suitable habitat for this species. This frog is also known to occur in pools in the completely dark regions of caves. Bodies of water having rocky bottoms and vegetation growing at the water's edge seem to be especially preferred. The Pickerel Frog is not widely distributed in Illinois and can be found commonly only in rather specific localities.

Breeding takes place during the latter part of April and the first two weeks in May. The eggs, which vary in number between 2,000 and 3,000, are laid in masses and are usually attached to submerged stems or other objects. Hatching occurs within two or three weeks, and the tadpoles transform three to three and one half months later.

Check List and Classification of Illinois Amphibians

Phylum: Chordata

Class: Amphibia

Order: Caudata (Salamanders)

Family: Cryptobranchidae

Cryptobranchus alleganiensis Hellbender

Family: Proteidae

Necturus maculosus Mudpuppy or Waterdog

Family: Sirenidae

Siren intermedia Dwarf Siren

Family: Ambystomidae

Ambystoma jeffersonianum Jefferson's Salamander

Ambystoma maculatum Spotted Salamander

Ambystoma opacum Marbled Salamander

Ambystoma talpoideum Mole Salamander

Ambystoma texanum Small-mouthed Salamander

Ambystoma tigrinum Tiger Salamander

Family: Salamandridae

Diemictylus viridescens Newt

Family: Plethodontidae

Desmognathus fuscus Dusky Salamander

Plethodon cinereus Red-backed Salamander

Plethodon dorsalis Zigzag Salamander

Plethodon glutinosus Slimy Salamander

Hemidactylium scutatum Eastern Four-toed Salamander

Eurycea bislineata Two-lined Salamander

Eurycea longicauda Long-tailed Salamander

Eurycea lucifuga Cave Salamander

Order: Anura (Toads & Frogs)

Family: Scaphiopidae

Scaphiopus holbrooki Eastern Spadefoot Toad

Family: Bufonidae

Bufo terrestris American Toad

Bufo woodhousei Woodhouse's Toad

Family: Hylidae

Acris gryllus Cricket Frog

Hyla cinerea Green Tree Frog

Hyla crucifer Spring Peeper

Hyla phaeocrypta Bird-voiced Tree Frog

Hyla versicolor Common Tree Frog

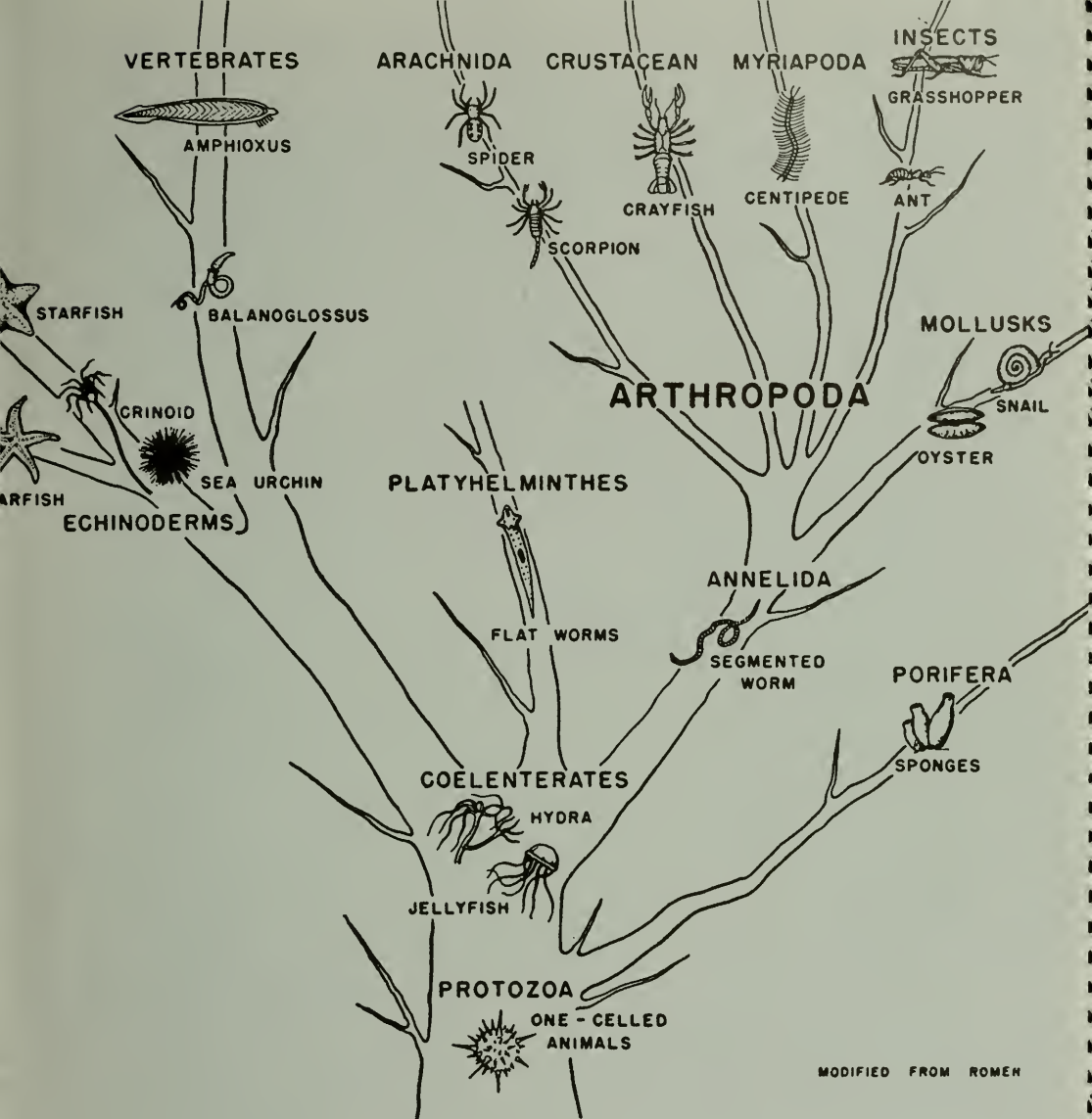
Pseudacris nigrita Swamp Tree Frog
Pseudacris streckeri Strecker's Chorus Frog

Family: Microhylidae
Microhyla carolinensis Narrow-mouthed Toad

Family: Ranidae
Rana areolata Crawfish Frog
Rana catesbeiana Bullfrog
Rana clamitans Green Frog
Rana sylvatica Wood Frog
Rana pipiens Leopard Frog
Rana palustris Pickerel Frog

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